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A REVIEW OF THE ASIATIC DALBERGIEAE

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ABSTRACT

The Asiatic *Dalbergieae* is restricted to only 2 genera while the remaining genera have been assigned to subtribes as discussed in this paper.

INTRODUCTION

The present paper is an assessment of the tribe Dalbergieae with particular reference to the Asiatic genera. Following a brief resume of the treatment of the tribe by earlier workers, comments on generic delimitations are summed up.

TREATMENT OF THE TRIBE

Brongniart while establishing Dalbergieae (1822) as a distinct tribe stressed the mode of germination of the embryos. This was further emphasized by De Candolle (1825) when he defined the tribe on account of curved embryos. Wight and Arnott (1834) treated it as one among the five subtribes of the tribe Papilionaceae and specifically mentioned the fleshy nature of the cotyledons as an important character. Miquel (1855) considered it one among the four tribes of the order Papilionaceae to include genera like *Dalbergia* L. f., *Pterocarpus* L. f. and *Euchresta* Benn. and simultaneously erected the tribe *Millettieae* to accommodate *Derris* Lour., *Pongamia* Vent., *Brachypterum* Wt., *Mundulea* DC. and *Millettia* Wt. et Arn. with a new genus *Aganope*. The tribe was characterised by mona- or diadelphous stamens, campanulate calyx, indehiscent to dehiscent legumes, opposite and pinnately compound leaves, and racemose inflorescence.

Bentham (1860) divided the tribe Dalbergieae into 3 subtribes namely Pterocarpeae (10 genera), Lonchocarpeae (8 genera) and Geoffroyeae (5 genera). He characterised the tribe by its woodiness, pinnately compound leaves with 5 or more leaflets, monadelphous stamens and indehiscent, 1-seeded pod. Baker (1876) regarded it as one among the 10 tribes of the sub-order Papilionaceae of the order Leguminosae while Kurz (1877) treated it as a subtribe of Galegeae of Papilionaceae.

P. Taubert (1894) treated Dalbergieae as one among the 10 tribes of the subfamily Papilionatae of Leguminosae and divided it into 4 subtribes (Pterocarpinae, Lonchocarpinae, Geoffraeinae and Anomalae). Melchior (1964) regarded it as one of the 9 tribes of the subfamily Faboideae of Fabaceae with 3 subtribes (Dalberginae, Lonchocarpinae, Geoffraeinae) included in it.

A drastic change in the status of the tribe was made by Hutchinson (1964) when he removed all the former genera from Dalbergieae except *Dalbergia* and included them in separate tribes such as Lonchocarpeae (*Lonchocarpus, Derris* etc.), Pterocarpeae (*Pterocarpus*) and Geoffroeae (*Euchresta* etc.). Gillet *et al.* (1971) removed *Mundulea* DC., *Tephrosia* Pers. and *Millettia* Wt. & Arn. from Galegeae and placed them in Tephrosieae.

In recent times the traditional genera of

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the subtribe Lonchocarpineae of Dalbergieae (*Derris, Pongamia, Lonchocarpus* etc.) together with *Tephrosia, Muellera, Mundulea* and *Wisteria* constitute the tribe Tephrosieae. The main character, followed since Bentham, in recognising Dalbergieae and Tephrosieae on the basis of indehiscent to dehiscent fruits does not hold any more. The Tephrosieae is distinguished from Dalbergieae by the more advanced flowers, keels more firmly joined and stamens joined together with a tendency for the vexillary filament to be dilated at base and commonly united to other stamens above the near basal opening on either side (Polhill, 1981).

The genus *Euchresta* has been segregated from Dalbergieae (Ohashi, 1983) and placed in a separate tribe Euchresteae.

It is therefore clear from the above that the concept of the tribe has changed a few times during the past 150 years.

TREATMENT OF GENERA

De Candolle (1825) removed *Muellera* from Lotees and placed it under Dalbergieae. Wight and Arnott (1834) established 2 subgenera under *Dalbergia* namely *Eudalbergia* representing all present day Dalbergias and *Brachypterum* to include all the true species of *Derris.* Miquel (1855) not only described *Aganope* as a distinct genus but elevated *Brachypterum* to a generic level and placed both under Millettieae while Bentham (1860) reduced both of them to sections under *Derris.* Kuntze (1891) made drastic changes following the principles of priority and according to him *Amerimnon* Br. (1756) [vs. *Dalbergia* L.f. (1781)], *Pterocarpus* L. (1747), [vs. *Derris* Lour. (1790)], *Lingoum* Rumph. (1742) (vs. *Pterocarpus* L. (1763) and *Caju* Rumph. (1741) [vs. *Pongamia* Vent. (1803)] were the correct names. Taubert too (1894) used the names *Deguelia* Aubl. (1775) and *Galedupa* Lam. (1788) versus *Derris* and *Pongamia* respectively. Several Asiatic genera (*Kunstleria* Prain, *Burkilliodendron* Sastry, *Fordia* Hemsley, *Padbruggea* Miq. and *Whitfordiodendron* Elmer were later added to the tribe Dalbergieae.

Polhill (1971) reviewed the generic status of *Aganope* Miq. and merged the African genus *Ostryoderris* Dunn in it. Bennett (1971) reduced *Pongamia* to a section (Pongam) of *Derris.* Verdcourt (1977) while admitting the confusion and status of the closely related genera (*Millettia, Derris, Pongamia, Leptoderris, Kunstleria*) still felt that *Pongamia* should be kept separate from *Derris.*

ASSESSMENT

Lonchocarpus, Derris, Millettia and *Pongamia* are so closely related genera and the fact remains that many taxa described earlier under any of them on insufficient material proved to belong to another genus when more material especially in fruiting stage became available. Generic delimitation based on dehiscent or indehiscent pods, as advocated by Bentham (1860), either to differentiate or to group them under different tribes cannot be used exclusively any more. A pod is basically a dehiscent fruit and splits into two halves that surrounded the seeds (Heywood, 1971). Dehiscent pods are uncommon but do exist in *Derris* (*D. microptera* Benth.) and *Lonchocarpus* while some species of *Millettia* do not dehisce or dehisce very lately (*Millettia cinerea* Benth., *M. pachycarpa* Benth.). The American species of *Derris* closely resemble *Lonchocarpus* except the winged pods. There are instances as in *Derris malaccensis* Prain where the wing is almost obsolete thus giving the pod an appearance like those of *Lonchocarpus* and *Pongamia. Milletia* and *Derris* share much in common except in the dehiscence and winged nature of pods, a character much variable to both the genera. *D. microptera* has lately dehiscent pods while some species of *Millettia* (*M. tetraptera*) have wing like thickenings at their pods. *Pongamia* represents an extreme form of

Derris (Bennett, 1971) approaching *Milletia* through *M. xylocarpa* Miq. but is still kept as a separate genus (Verdcourt, 1977). In all these three genera the floral construction is basically equal, differing only in characters like inflorescences, shape and auricles of wings and keels, mona-or diadelphous stamens, stipitate or nonstipitate ovary, few to many ovules.

At the moment *Derris* by its indehiscent, winged pods, *Pongamia* by its indehiscent, nonwinged pods and *Millettia* by its dehiscent and nonwinged pods, thickened at sutures stand to be recognised as separate genera.

Ostryoderris Dunn, an African genus with 3 species has been merged with *Aganope* Miq. by Polhill (1971) who however considered the latter to be distinct from *Derris*. The merger of *Ostryoderris* with *Aganope*, characterised by diadelphous stamens and distinctly winged pods as advocated by Polhill is quite in order. It remains to be seen whether the characters such as the thrysoid inflorescence, diadelphous stamens of *Aganope* warrant a separate generic status.

A Chino-Malesian genus *Fordia* Hemsely, with about 6 species (1886) is again a close ally of *Millettia*. The leaf characters of this genus form a gradual transition towards those of *Millettia sericea* and allied species while occasional axillary position of raceme in *Fordia filipes* Dunn makes it a connecting link to *Millettia*. *Whitfordiodendron* Elmer, (*Adinobotrys* Dunn) a S. E. Asiatic genus with about 10 species and *Padruggea* Miq., a Malesian genus with 2-3 species are closely related genera, basically derived from *Millettia*. A critical study as to the taxonomic status of the above Malesian genera will lead to either merger of many among themselves or ultimately with *Millettia*.

CONCLUSION

The Asiatic Dalbergieae sens. lat. is therefore restricted to only 2 genera, *Dalbergia* and *Pterocarpus* and the remaining such as *Derris, Pongamia, Aganope, Whitfordiodendron, Fordia, Padbruggea, Burkilliodendron* of the subtribe Lonchocarpinae together with *Tephrosia, Mundulea, Millettia* of Tephrosinae are placed in Tephrosieae. *Euchresta* takes its place in Euchresteae.

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